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M. B. Mittleman

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Howard K. Gloyd, Director of the Museum

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# Geographic Variation in Marcy's Garter Snake *Thamnophis marcianus* (Baird and Girard)

M. B. Mittleman

Although described nearly 100 years ago, ***Thamnophis marcianus*** has never been subjected to a detailed zoogeographic study. Ruthven, in discussing this species (1908), noted its apparent homogeneity, and later writers such as Van Denburgh (1922) and Smith (1942) have contributed to the general fund of knowledge concerning the distribution and natural history of this snake but have actually shed little light on its variability. Recent years have seen the accumulation of a considerable number of specimens, and with this new material it is now possible to approximate the true geographic variability of ***marcianus.***

## STRUCTURAL VARIATION

***Dorsal Scales.*** The dorsal scales in the type, and in slightly more than 94 per cent of 219 specimens, are in 21 rows from the neck to the anterior part of the last third of the body, at which point a pair of rows ***is*** dropped, producing a count of 19, and shortly thereafter (slightly anterior to the vent) another pair is dropped, resulting in a final count of 17; thus, the normal dorsal scale row formula for this species is 21-21-19-17. In a ***few specimens,*** certain abnormalities have been noted; for the most part, these result from the aberrant addition or deletion of a pair of scale rows, but in a ***few*** instances scale rows have been kept which are normally dropped.

A relatively common aberration occurs through the intercalation of an additional scale row on each side of the body; this usually occurs at about the middle of the anterior third of the body, and after continuing for a short distance the anomalous rows are dropped. In some specimens the interposed rows may extend for only about 10 ventrals before they disappear, resulting

*35 John Alden Rd., New Rochelle, New York.

in the formula 21-23-21-21-19-17 (as in USNM* 32817 ♀, Paisano, Presidio Co., Tex.), or they may extend for almost two-thirds of the body length, and then disappear abruptly together with another pair of rows, as reflected in the formula 21-23-23-19-17 (BCB 4449e, Port Isabel, Cameron Co., Tex.; AJK 1826 ♀, Brenham, Washington Co., Tex.). A much rarer condition, seen in only one specimen, resulted from the interposition of a single extra scale row on the midline of the back, resulting in the formula 21-22-22-21-19-17 (USNM 32814 ♀, Corpus Christi, Nueces Co., Tex.). An equally rare condition seen in only one specimen was the result of the retention of the pair of rows which is normally dropped just anterior to the vent; in this specimen (BCB 621 ♀, Lake La Joya, 10 mi. w. of Mission, Hidalgo Co., Tex.) the scale formula is 21-21-19-19. The reverse of this condition, e, where a pair of rows is dropped well anterior to the usual point, was found in one specimen (AJK 2053 ♀, Mertzon, Irion Co., Tex.) with the formula 21-19-19-17. The final type of anomaly is characterized by the lack of a pair of scale rows on the anterior part of the body, with the missing pair subsequently reappear- ing, followed by normal scalation, thus: 19-21-21-19-17 (BCB 2893e, 1 mi. s.w. of Reynosa, Tamaulipas, Mex.; USNM 104638e, Rio Sta. Maria, nr. Progreso, Chihuahua, Mex.; BCB 4032e, 3 mi. s.e. of Eola, Concho Co., Tex.).

There is no discernible association between these various aberrations and sex, or geographic origin.

*Ventrals.* Baird and Girard (1853, p. 37) found a ventral count range of 145-163 in the 10 specimens which comprised the type series of *marcianus,* and later writers (Ruthven, 1908; Van Denburgh, 1922; Schmidt and Davis, 1941; Smith, 1942) who have treated this species have reported substantially the same limits of variation. However, I find the full range of ventral counts in 225 specimens of *marcianus* is from 140 (USNM 20853 ♀, Fort Clark, Kinney Co., Tex.) to 173 (USNM 60234e, Canon del Muerto, Apache Co., Ariz.).

In female specimens of *marcianus* from southwestern Oklahoma and that part of Texas lying east (approximately) of Long. 100°, as well as in females from the Mexican states of Tamaulipas (as far south as Lat. 22° 45% Nuevo Leon, Coahuila, and the extreme eastern parts of Durango and Chihuahua, the ventral count is quite homogeneous, ranging from 140 to 162 (av. 149.1 ±3.92). However, a relatively abrupt transition in the female ventral count takes place along the eastern frontier of the Great Plains in west-central Texas,

*Abbreviations used for collections: USNM—United States National Museum; CNHM—Chicago Natural History Museum; BCB—private collection of Bryce C. Brown; AJK—private collection of Albert J. Kim; EHT-HMS---Edward H. Taylor-Hobart M. Smith collection; CAS—Chicago Academy of Sciences.

Oklahoma, and Kansas, so that specimens from localities lying to the west of this natural barrier in these three states and from points west of the eastern bastion of the Stockton Plateau in the big bend of Texas, as well as the states of New Mexico, Arizona, California, and the Mexican states of Chihuahua and Sonora, show a ventral count range of 150 to 166 (av. 156.8±3.21). These ventral count ranges are very pronounced, since 75 out of 79 eastern females (95%) have a count of 155 or less, while 48 out of 60 western fe males (80%) have a count of 156 or more. That this difference is highly significant and does not arise from random sampling errors is shown by the fact that the difference between the means is much greater than four times its standard error (D/S.E.------12.38). Hence, 123 out of 139 females (88.5%) can be correctly identified as to an eastern or western origin (as defined above) on the basis of the ventral count alone.

A similar geographic differentiation is found in male specimens. Snakes from eastern Texas, southwestern Oklahoma, and the northeastern Mexican states enumerated heretofore, have ventral counts ranging from 146 to 158 ( av. 152.4±2.92), while male specimens from the western areas of the United States and Mexico (as delineated above) vary from 153 to 173 (av. 161.1± 3.85). Out of 42 eastern males, 37 (88%) have ventral counts of 155 or less, while 41 western males (93.2%) have ventral counts of 156 or more. The difference between the means of the two samples is highly significant, being 11.79 times the standard error of the difference. A total of 78 males out of 86 (90.6%) can be correctly identified as to an eastern or western provenance on the basis of the ventral count alone.

*Caudals.* Recently published data by various authors established a caudal count variation of from 62 to 79 for *Thamnophis marcianus,* but in the specimens available to me I find a range of 61 (BCB 1251 9, 2 mi. s.w. of Mendoza, Caldwell Co., Tex.) to 83 (BCB 4020 9 , 5 mi. n.e. of Eden, Concho Co., Tex.). In 30 eastern males the caudal count ranges from 64 to 81, while in 47 eastern females the caudal count spread is from 61 to 77. A count of 73 or more is found in 23 out of 30 males (77%), while a count of 72 or less characterizes 42 out of 47 females (89%). These differences are highly significant and indicate a prominent sexual dimorphism in the caudal count. The sexes in western specimens display a similar dimorphism in the caudal count, for 32 western males have a full caudal range of 69 to 82, while 39 females have a range of 62 to 83. A count of 70 or more is found in 31 western males (97%), while 31 out of 39 females (79.5%) have a caudal count of 69 or less.

Despite the prominent sexual dimorphism in caudal counts, there is no significant difference in this character which legitimately can be ascribed to a

geographic trend. The sexes of the two populations are almost identical in their caudal counts. However, although the caudal count is in itself of no value as a dichotomous character for distinguishing between the eastern and western populations, the combination of ventrals plus caudals shows a highly significant association with geographic origin. In 47 eastern females the range of combined ventrals and caudals is from 207 to 239; the average is 217.7 ± 6. 31. By contrast, in 39 western females the combined ventrals and caudals vary from 213 to 241 and average 225 ± 5.38. That the difference between these two samples does not arise from random sampling errors is shown by the fact that the standard error of the difference between the means enters the difference 5.71 times. Eastern and western males are even more sharply distinct than are the females; 30 eastern males show a range of 214 to 236 in their combined ventrals and caudals and average 225 ± 5.28, while 30 western males vary from 225 to 255 and average 236 ± 5.85. Again, this difference is highly significant, the difference between the means being 7.64 times its standard error. Out of a total of 47 eastern females, 36 (76.5%) speci mens have a combined ventral and caudal count of 221 or less, while 29 western females out of a total of 39 (74.5 %) have a count of 222 or more. In the 30 eastern males, 26 (86.6%) have a combined ventral and caudal count of 231 or less, while of the 30 western males 23 (76.7 %) have a count of 232 or more.

*Supralabials.* The normal supralabial count in *Thamnophis marcianus is* 8-8; however, certain aberrations have been seen in 22 out of 225 specimens studied. The frequencies of the various supralabial counts, and their association with the eastern and western populations, by sex, may be seen in Table I.

**Table I. Variation in Supralabials**

| | Number of Specimens | | | |
|---|---|---|---|---|
| 6-6 | | | | 1 |
| 6-7 | 1 | | | |
| 7-7 | 1 | | | |
| 7-8 | 6 | 4 | 5 | |
| 8-8 | 33 | 74 | 38 | 58 |
| 8-9 | 1 | 1 | 1 | 1 |
| | 42 | 79 | 44 | 60 |

The frequency of supralabial aberration in the eastern and western populations differs slightly (11.5 per cent in eastern specimens, 7.7 per cent in western specimens) and is not significant. However, examination of the supralabial frequency table shows that 15 out of 22 cases of aberration occur in

males. A chi-square value of 9.25 confirms the association between sex and supralabial abnormality.

***Infralabials.*** The normal infralabial formula in ***marcianus*** is 10-10; there are, however, a considerable number of variations which occur; not less than 54 specimens out of 225 examined (24%) display some form of infralabial abnormality, as shown in Table II

Table II. Variation in Infralabials

| Infralabial Formula | eastern ♂ | eastern ♀ | western ♂ | western ♀ |
|---|---|---|---|---|
| 8-9 | | | | 1 |
| 8-10 | | | | 1 |
| 9-9 | | 1 | 1 | 1 |
| 9-10 | 6 | 3 | 3 | 3 |
| 9-11 | | 1 | 1 | |
| 10-10 | 32 | 63 | 36 | 40 |
| 10-11 | 3 | 6 | 3 | 6 |
| 11-11 | 1 | 5 | | 7 |
| 12-----12 | | | | 1 |
| | 42 | 79 | 44 | 60 |

There is no significant association between infralabial variation and sex ( male aberration rate 20.9 per cent; female aberration rate 25.9 per cent), or between infralabial variation and geographic origin, although western females show a somewhat higher rate of aberration than do eastern females or males generally.

Ruthven (1908, p. 24, 29), in discussing labial variation in the garter snakes, has postulated that "the number of upper and lower labials are correlated . . . . a reduction in the supralabials is associated with a decrease in the number of infralabials." Quite possibly this hypothesis is borne out in other species of ***Thamnophis,*** but in the series of ***marcianus*** included in this study no such correlation or association is evident to a significant degree. In 18 cases of supralabial reduction only 5 specimens exhibit a simultaneous reduction in the infralabial count, while 5 other specimens show a simultaneous increase in the number of infralabials. However, it is found that aberration *per se,* in either the upper or lower labials, tends to be associated with aberration in the opposite set of labials. Out of 73 instances of supralabial or infralabial abnormality, 10 specimens show dual aberrations; *e.,* departure from the normal count in both upper and lower labials simultaneously. That this degree of bi-abnormality is indicative of some factor other than mere chance is shown by a chi-square value of 18.24 in testing the association of aberration in one set of labials with the simultaneous appearance of aberration in

the other set. Presumably, some kind of selectivity is operative under certain conditions, such that a concomitant deviation is effected in both the upper and lower labials. There is no significant association between labial bi-abnormality and sex, or geographic origin.

***Oculars.*** The preoculars in ***Thamnophis marcianus*** are almost always 1-1; only three instances of aberration have been noted: a female specimen with preoculars 2-1 (BCB 2893, 1 mi. s.w. of Reynosa, Tamaulipas, Mex.), another female with preoculars 2-2 (USNM 32804, Rio Grande River, at Boquillas, Brewster Co., Tex.), and a male with preoculars 3-3 (**CAS** 12442, Musquiz Creek, 9 mi. s.e. of Fort Davis, Jeff Davis Co., Tex.).

The postoculars are not nearly so stable as the preoculars, considerable variation having been observed, as shown in Table III.

TableIII. Variation in Postoculars

| Postocular Formula | Number of Specimens | | | |
|---|---|---|---|---|
| | eastern ♂ | | eastern ♀ | western ♂ |
| 2-2 | 1 | | | |
| 2-3 | | | 1 | |
| 2-4 | | | 1 | |
| 3-3 | 14 | 21 | 14 | 14 |
| 3-4 | 10 | 10 | 10 | 15 |
| 4-4 | 17 | 48 | 17 | 29 |
| 4-5 | | | 1 | 2 |
| | 42 | 79 | 44 | 60 |

A formula of 3-3 or 4-4 must be considered normal insofar as 77 per cent of all specimens seen fall within one or the other of these two categories. A formula of 4-4 is more prevalent, since it occurs approximately 1.75 times more frequently than does the 3-3 count. There is no significant degree of association between the postocular count and sex, or geographic origin. There is likewise no significant association between postocular aberration and sex, or geographic origin.

***Dentition.*** The maxillary teeth in 20 specimens of ***marcianus*** vary from 21 to 24, the last three teeth being much larger than any of their predecessors. Some minor degree of association between the maxillary tooth count and geographic origin is apparent, so far as a count of 24 has been found 5 times in 9 western specimens but occurs only once in the 11 eastern specimens examined.

The dentary teeth vary from 27 to 29 in 15 specimens from all parts of the range. The dentary tooth count is 28 in 12 specimens, 27 in two specimens, and 29 in one.

There is no detectable association between maxillary and/or dentary tooth counts and sex.

*Pattern and Color. Thamnophis marcianus* has been recognized generally as a rather pallid garter snake, possessing a checkerboard pattern dorsally plus a vertebral and a pair of lateral light stripes. In addition, the species is characterized by a prominent light postrictal blotch, followed by a dark nuchal spot. The belly is generally unmarked, except for a small spot on each end of the individual ventral scutes. Most importantly, the lateral stripe (when evident) has been held to be restricted invariably to the third dorsal scale row, at least anteriorly.

The type of *marcianus (a* large female), has the lateral stripe situated on the third scale row for the greater length (about three-quarters) of the body, and on the second and third rows, and ultimately the second row only, on the posterior part of the body. The vertebral stripe varies from one scale row in width (up to about the middle of the body), to one row plus two half rows (for the posterior part of the body), and ultimately occupies two scale rows just prior to the level of the vent. The belly is uniform tan, with a single, small, sharply-defined dot on the ends of each ventral scute, or some- times with both dots and a small blotch on the anterolateral portion of each scute. The labials are bordered heavily with black both anteriorly and pos- teriorly, their centers being mostly light. There is a prominent postrictal light crescent on each side of the head, followed by a heavy nuchal blotch. Most of these characters are well illustrated in Baird and Girard's plate of *marcianus* (1854, pl. 3).

A number of deviations from the pattern and color of the type, and of the majority of specimens, have been observed. For example, in USNM 92754, 15 mi. n.w. of Dickens, Dickens Co., Tex., the dorsal stripe is very sharply defined, and for practically its entire length it is only two-thirds to three-quarters of a scale row wide. In USNM 92755, from the same locality, the vertebral stripe is slightly wider, just occupying a full scale row. Other specimens with vertebral stripes varying from one-half to one scale row in width are: USNM 71755, Somerset, Bexar Co., Tex.; USNM 78623, Victoria, Victoria Co., Tex.; USNM 17557, Tucson, Ariz.; USNM 852, Ft. Yuma, Calif.; USNM 95183, 38 mi. s.e. of Reynosa, Tamaulipas, Mexico. There is no association between provenance and the width of the dorsal stripe in *marcianus;* despite some variations, as noted above, the majority of specimens agree with the type.

Smith (1942, p. 114) has laid considerable stress on the importance of the width of the vertebral stripe in diagnosing the recently-described *Thamnophis ruthveni* (Hartweg and Oliver, 1938). According to Smith, the dorsal

stripe in *ruthveni* is restricted to the vertebral scale row, and the species is thereby differentiated from *marcianus* which has the dorsal stripe occupying a scale row plus half of each of the adjacent scale rows. I have seen only a single specimen of *ruthveni* (CNHM 40432 ♀, Tehuantepec, Oaxaca); this individual, with 145 ventrals and 61 caudals is not distinguishable from a great many *marcianus* on any basis other than the combined count of ventrals and caudals. Its pattern and color are duplicated by many *marcianus;* the vertebral stripe, for example, is no narrower than in CNHM 28819, Hacienda La Mariposa, Coahuila. Doubtless *ruthveni* is a distinct form, but almost certainly, a statistical study of the known specimens will show it to be very close to *marcianus.* Even the apparent hiatus between the range of *ruthveni* and that of *marcianus* is much narrowed by CNHM 38592e, Villa Juarez, Tamaulipas (approx. Lat. 22°45', Long. 99°), which closes the gap between these two species to approximately 500 miles. Apparently, *ruthveni* is a direct derivative of *marcianus, via* the Sierra Madre del Oriental; it may well be that an annectent population still exists between the known ranges of *ruthveni* and *marcianus.* The geographical relationships of these two species are illustrated almost perfectly in Gloyd's map of the distribution of *Crotalus atrox* (1940, p. 206).

The position of the lateral stripe has for long been considered highly important in the definition of the various forms of *Thamnophis.* In *marcianus* the lateral stripe is characteristically on the third scale row anteriorly, and for the greater length of the body. Yet in some snakes of this species which are not otherwise different from the majority of *marcianus,* the lateral stripe involves the third and fourth dorsal scale rows anteriorly, as in USNM 21820 and 21822, both from the Colorado River, 10 mi. below Yuma, Arizona, and USNM 852, Ft. Yuma, California. In these specimens, the lateral stripe occupies the third and fourth scale rows on the anterior fifth of the body, is restricted to the third row for the middle three-fifths of the body, and occupies the second and third scales rows on the last fifth of the body.

The ventral color and pattern in *marcianus* shows a moderate range of variation, from an ashy white to a clouded slatey gray, with a slightly darker median area in each ventral scute. The anterolateral dark spots and dots are variable, most specimens having the spots, many lacking the dots.

## THE TYPE LOCALITY

Baird and Girard's original description of *Eutaenia marciana* (1853, p. 36) stipulates no more exact type locality than simply "Red River, Ark." Ruthven (1908, p. 58) has identified the type locality more closely by stipulating

"Cache Creek in what is now Oklahoma." Ruthven's designation is only approximately correct; actually, the type locality can be placed with greater specificity.

In the jar containing the type of *marcianus* (USNM 844 9 ), is a slip of paper with the following data: "Ind. Terr. betty. Camp 5 and Red R. 20 My 52. Marcy." Fortunately, this information, taken in conjunction with Marcy's published log (1854), permits the computation of his daily route in terms of present-day geography and place names, and thereby makes possible the determination of the type locality of *marcianus* with considerable exactness.

Marcy's historical explorations commenced on May 2, 1852, on which date he started from Fort Belknap (about a mile south of what is now New Castle, Young County), Texas. The expedition traveled in a northeasterly direction along the Little Wichita River, until the Red River was encountered, and thereafter proceeded to follow the Red River on the south (Texas) bank for several days. On May 12th, the Red River was crossed at the point of its confluence with the Big Wichita River. From the 13th to the 16th of May, the party traveled a total of slightly more than 15 miles, proceeding first along Cache Creek (a tributary of the Red River, in Cotton Co., Oklahoma) and then along the high ridge which runs between Deep Red Run ( a major tributary of Cache Creek) and the Red River. By May 18th, the party had traveled approximately another 25 miles, continuing in a generally westerly (and slightly northerly) direction along Deep Red Run, and made Camp No. 4 just above the confluence of Slough Creek and Deep Red Run ( in eastern Tillman County, Oklahoma). On May 19th, due to a severe rainstorm, no further progress was made. On May 20th, Camp No. 5 was pitched on the banks of Slough Creek at a point approximately 4.4 miles n.w. of Camp No. 4, the traveling on this day having been along Slough Creek. As nearly as can be determined, using Marcy's compass bearings and computed mileages, Camp No. 5 was situated at a point approximately 2.5 miles e.n.e. of the present-day town of Hollister, Tillman County, Oklahoma. Marcy's report stresses that due to the heavy rainfall on the previous day, very rough going was encountered on the 20th; it therefore seems reasonable to believe that the type of *marcianus,* which was collected on the 20th, must have been taken somewhere between Camps 4 and 5 along Slough Creek. In the light of this information, it is suggested that the type locality of *T. marcianus* be restricted to the vicinity of Slough Creek, east of Hollister, Tillman County, Oklahoma.

## TAXONOMIC SUMMARY

In the light of the geographic and biometric evidence reported here, is readily apparent that the species *Thamnophis marcianus,* as heretofore recognized, is composed of two vicarious forms. One, the nominate race, ranges from southwestern Oklahoma through eastern and central-western Texas to the Llano Estacado and the Stockton Plateau, and south to extreme eastern Chihuahua, northeastern Durango, and southern Tamaulipas. The other race, for which the name *Eutaenia nigrolateris* Brown (1889, p. 421) is available, occupies the western part of the range of the species *(sensu lato),* from western Texas and the western Plains Border in Oklahoma and Kansas, west to southeastern California, and south to Sonora and Chihuahua (Fig. 1). These two subspecies may be defined as follows:

### *Thamnophis marcianus marcianus* (Baird and Girard)

1853 *Eutaenia Marciana* Baird and Girard, Cat. N. Amer. Rept., p. 36. *Type locality:* Red River, Ark. (vicinity of Slough Creek, east of Hollister, Tillman Co., Okla.).

*Diagnosis:* Dorsal scale rows 21-21-19-17. Ventrals (male) 146-158 ( $a^y$. 152.4 ± 2.92), 155 or less in 88 per cent of specimens; (female) 140-162 ($a^y$ . 149.1 ± 3.92) 155 or less in 95 per cent of specimens. Caudals (male) 64-81, 73 or more in *77* per cent of specimens; (female) 61-77, 72 or less in 89 per cent of specimens. Combined ventrals and caudals (male) 214-236 (av. 225 ± 5.38), 231 or less in 86.6 per cent of specimens; (female) 207- 239 (av . 217.7 6.31), 221 or less in 76 per cent of specimens. Supra-labials 8-8, infralabials 10-10, preoculars 1-1, postoculars 3-3 or 4-4. Maxillary teeth 21-24, usually 23 or less; dentary teeth 27-29. Lateral stripe on third dorsal scale row anteriorly, and on second and third, or second only, posteriorly. Dorsal stripe occupying one-half or more of the vertebral scale row, and usually about half of each of the paravertebral scale rows. A yellow postrictal crescent.

*Range:* Southwestern Oklahoma, eastern and central-western Texas to the Llano Estacado and the Stockton Plateau; Nuevo Leon, Coahuila, Tamaulipas, northeastern Durango, and extreme eastern Chihuahua.

*Specimens studied:*

OKLAHOMA: *Comanche Co.-7* mi. D. of Cache (CAS 3902); 5 mi. n. of Cache (CAS 3903); 5 mi. n.e. of Cache (CAS 3868-9). *Tillman* Co.—vicinity of Slough Creek, east of Hollister (USNM 844, TYPE).

TEXAS: *Atascosa* Co.—Benton (EHT-HMS 559). *Bee* Co.—Beeville (USNM 44305). *Bexar Co.-8* mi. *s.w.* of Somerset (AJK 1325, 1625, 1765A, 2066-7, 2081, 2096, 2099); Somerset (USNM 71755); San Antonio (USNM 10713); 16 mi. n.e. of

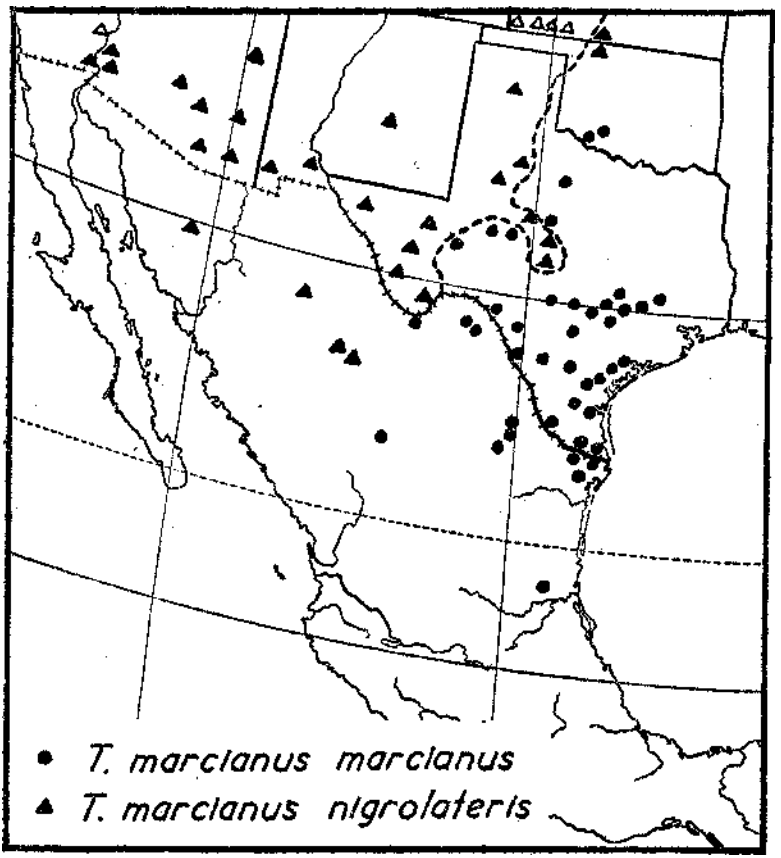


Figure 1. Distribution of the races of *Thamnophis marcianus*. Solid symbols stand for county records of specimens examined; hollow symbols denote accepted and determinable published records. The heavy dashed line in Kansas, Oklahoma, and Texas marks the eastern border of the Great Plains Province, except for the Edwards Plateau section.

San Antonio (AJK, no number). *Caldwell Co.-2* **mi.** s.w. of Mendoza (Ben 1250-2). *Cameron* Co.-Brownsville (USNM 1369, 25399, 32803); Port Isabel **(BCB 4449, USNM 851);** no specific locality (USNM 17048-54). *Carnal* Co.-Fischer's Store (BCB 1872). *Duval Co.-San* Diego (USNM 15664). *Fayette* Co.-Ruthersville (USNM 860). *Goliad Co.-5* mi. n.e. of Goliad (CAS 12406). *Guadalupe* **Co.Seguin** (USNM 35634). *Hays Co.-San* Marcos **(BCB** 64); 2.5 mi. e. of Wimberley (Ben 2718). *Hidalgo Co.-* McAllen (USNM 82288-9); Lake La Joya, 10 mi. w. of Mission (BCB 65, 621). *Irian* Co.- Mertzon (AJK 2053). *Kendall Co.-4* **mi.** e. of Bergheim (Ben 63). Kerr *Co.-* Quinlan Creek, nr. Kerrville (USNM 22329). *Kinney* Co.-Fort Clark (USNM 20853-4). *Live Oak Co.-3* mi. e. of Three Rivers (AJK 1848). *Maverick Co.-Eagle* Pass ( USNM **418).** *Nueces* Co.-Corpus Christi (USNM 32805, 32811, 32814). *Pecos Ca.-* 15 mi. n.e. of Fort Stockton (USNM 92884). *Reagan* Co.-20 mi. n. of Big Lake ( AJK 2048-9). *Runnels* **Co.-Ballinger (AJK.** 2196). *Shackelford Co.-2* **mi.** e. of Albany (CNHM 27721). *Travis* Co.-Austin (BCB 66, 1753). *Valverde* Co.-nr. Devils **River** (USNM 32810). *Victoria* **Co.-Victoria** (USNM 32809, 78623). *Washington* Co. -Brenham (AJK. unnumbered adult 9 and 15 young, also nos. 1826, 2093, 2106, 2253-5, 2270, 2304-6, 2309, 2375, 2490-2). *Zapata* Co.-nr. Zapata **(EHT-HMS** 562). *Zavala* Co.-Crystal City (AJK. 2009). County uncertain: "32nd Parallel" (USNM 45594).

**MEXICO. COAHUILA:** Sierra del Carmen (CNHM 47071, 47076-78); Hermanas (CNHM 47080). **CHIHUAHUA:** Ojos del Diables (USNM **30837);** Santa Helena Cañon **(CNHM** 26135). **DURANGO:** betw. Lerdo and La Goma (USNM 105295). **NUEVO LEON:** Sabinas Hidalgo **(EHT-HMS** 28653); Mamulique Pass, 20 **mi.** s. of Sabinas Hidalgo **( EHT-HMS** 5287); **8 mi. w. of Monterrey (EHT-HMS** 23615). **TAMAULIPAS:** 1 mi. s.w. of Reynosa (BCB 2893); 38 mi. s.e. of Reynosa (USNM 95183); Charco Escondido ( USNM 849); Matamoras **(USNM** 861-three specimens, **USNM** 5491, 15344); **Villa Juarez ( CNHM 38592). State** uncertain: "15 leagues n. of Guerrero" (USNM 46583).

### *Thamnophis marcianus nigrolateris* (Brown)

**1889** *Eutaenia nigrolateris* **Brown, Proc. Acad. Nat.** Sci. **Philadelphia, p.** 421. *Type locality:* **Tucson, Arizona.**

*Diagnosis:* **Essentially similar in all respects to T** *marcianus marcianus,* **except as follows: ventrals (male) 153-173 (av. 161.1 ± 3.85), 156 or more in 93.2 per cent of specimens; (female) 150-166 (av. 156.8 ± 3.21), 156 or more in 80 per cent of specimens. Caudals (male) 69-82, 70 or more in 97 per cent of specimens; (female) 62-83, 69 or less in 79.5 per cent of specimens. Combined ventrals and caudals (male) 225-255 (av. 236 ± 5.85), 232 or more in 76.7 per cent of specimens; (female) 213-241** (av. 225 ± **5.3 8), 222 or more in 74.5 per cent of specimens. Maxillary teeth 21-24, often** 24.

*Range:* **From the Great Plains and the Stockton Plateau in Texas, and the Plains Border in Oklahoma and Kansas, west to southeastern California, and south to Sonora and Chihuahua.**

*Specimens studied:*

ARIZONA: *Apache* Co.-Cañon del Muerto (USNM 60234). *Cochise Co.-1* mi. s.w. of Chiricahua (CAS 12444). *Graham* Co.-1.5 mi. e. of Solomonsville (CAS 9235, 10434-5); 10 mi. e. of Safford (CAS 9987); 5.5 mi. s. of Safford (CAS 11009, 11246); 6 mi. s. of Safford (CAS 11188, 11190-93, 11195-8). *Maricopa Co.-1* mi. n. of Mesa (CAS 5299); Phoenix (USNM 55990-1); Gila Bend (USNM 61632). *Pima* Co.-Sabino Cañon Rd., 7 mi. n.e. of Tucson (CNHM 51751); 21 mi. n.e. of Tucson ( CNHM 51752); 8 mi. n.e. of Tucson, 2000 ft. (CAS 13697); 2 mi. n. of Sahuarita (CAS 10349); Tucson (USNM 16947, 17442, 17557). *Pinal Co.-3* mi. w. of Florence ( CAS 10300); 0.2 mi. n. of Florence (CAS 14212). *Yuma* Co.-Colorado River, 10 Mi. below Yuma (USNM 21819-22).

CALIFORNIA: *Imperial* Co.-Fort Yuma (USNM 852-two specimens).

KANSAS: *Barber* Co.-Lake City (CNHM 23366).

NEW MEXICO: *Dona Ana Co.-nr.* Mesilla Dam (USNM 100895). *Hidalgo* Co.-Animas Valley, at 5000 ft. (USNM 44502). *Lincoln* Co.-10 mi. n. of Capitan Mts. (USNM 44393). County uncertain: "near Lat. 32°" (USNM 1370).

OKLAHOMA; *Woods Co.-Alva* (CNHM 565).

TEXAS: *Borden Co.-7* mi. *n.* of Vincent (BCB 4041). *Brewster* Co.-Rio Grande River, at Boquillas (USNM 103679, 32804); 1 mi. s.w. of Boquillas (CNHM 26260). *Carson* Co.-nr. Conway (USNM 95250); 9 mi. w. of Conway (USNM 99770). *Coke Co.-3* mi. w. of Robert Lee (AJK 1940). *Concho Co.-6* mi. w. of Eden (acs 4016); 5 mi. n.e. of Eden (BCB 4020); 3 mi. s.e. of Eola (BCB 4032). *Dickens Co.*-Dickens (USNM 92752-5). *Hudspeth* Co.-Fort Hancock (USNM 20656). *Jeff Davis* Co.-Musquiz Creek, 9 mi. s.e. of Fort Davis (CAS 12422-43). *Linn Co.-7 mi. n.* of O' Donnell (USNM 92811). *Menard* Co.-Menard (BCB 1757). *Presidio Co.-Pais*- ano ( USNM 32813, 32816-7). *Reeves* Co.-10 mi. s. of Toyahvale (CAS 12407-15).

MEXICO. **CHIHUAHUA:** Rio San Pedro, betw. Chihuahua City and Naica ( **EHT-HMS** 5320, 5419, 5423); 10 mi. n. of Ciudad Delicias (USNM 105293); Rio Santa Maria, nr. Progreso (USNM 104634-41). **SONORA:** No specific locality (USNM 7235).

**This race is known also from Picacho, Imperial County, and Riverside Mountain, Colorado River, Riverside County, California (Van Denburgh, 1922, p. 851); also Spring Creek, Morton County and Meade, Meade County (Taylor, 1929, p. 59), Liberal, Seward County, and Clark County (no locality), Kansas (Smith, 1946, p. 99). Benjamin Shreve has furnished scale counts on two additional specimens (MCZ 39979, Tucson, Arizona; and MCZ 14149, Las Cruces, Doña Ana County, New Mexico). Although included in Smith's recapitulation of Mexican *Thamnophis,* the record for Sonora was overlooked by Bogert and Oliver in their recent review of the herpetofauna of this Mexican state (1945). It is unfortunate that the sole record for Sonora lacks more specific data; as Stejneger points out (1940, p. 204), a number of Emory's specimens (of which this is one) were collected in the region around**

what is now the international boundary between Arizona and Sonora, but which at the time of collection was wholly Mexican (Sonoran) territory. Hence, there is little probability that the exact provenance of this specimen will ever be known. Nonetheless, with *nigrolateris* known from many localities in Pima and Cochise Counties, Arizona, there can be little reasonable doubt that this race occurs in Sonora.

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